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EXAMINER	
EL CHANTI, HUSSEIN A	

ART UNIT	PAPER NUMBER
2157	

DATE MAILED: 03/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/538,132	LIAO, HENG	
	Examiner	Art Unit	
	Hussein A El-chanti	2157	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 December 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response To Amendment

1. This action is responsive to communication received on Dec. 29, 2003. Claims 1-54 are pending.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 11 is rejected under 35 U.S.C. 102(e) as being anticipated by Riddle et al., U.S. Patent No. 6,457,051 (referred to hereafter as Riddle).

Riddle teaches a method for classifying data packets comprising the steps of:

providing one or more regular expressions, each having an associated class identifier (see Table 3 and fig. 4A);

receiving plural data packets, each having a length not necessarily equal to one another (see claim 1); and

for each data packet, determining a matching one of said regular expressions that matches said data packet, wherein said each data packet is classified according to the class identifier associated with said matching regular expression (see Table 3 and claim 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, 4 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riddle in view of Tang, U.S. Patent No. 5,378,126.

As to claim 1, Riddle teaches a method for classifying received network data comprising scanning incoming data wherein said network data is treated as a stream of input bytes (see col. 2 lines 21-27), said network data being organized into data packets (see claim 1), said scanning resulting in the identification of a data packet belonging to one of a plurality of classes (see claim 1).

Riddle doesn't teach the limitation "scanning data network using lexical token scanning". However Tang teaches scanning data using lexical token scanning (see abstract, statements in a program are lexically scanned and parsed into a parse tree).

It would have been obvious for one of the ordinary skill in the art at the time of the invention to modify Riddle in view of lexically scanning incoming data packets and parsing the lexical tokens as in Tang. One would be motivated to include lexical scanning of packets and parsing lexical tokens in Riddle because doing so would allow the processor to read the specific lexical token relating to the control protocol layer that the instruction belongs to rather than reading the whole instruction or packet and thus creating faster communications medium and faster data routing.

As to claim 2, Riddle teaches scanning includes identifying an arithmetic operation and performing said arithmetic operation (see col. 14 lines 5-8, the system optionally keeps track of the number of bytes being scanned).

As to claim 4, Riddle teaches providing a set of regular expressions, each regular expression having an associated class identifier (see Table. 3 and claim 1).

As to claim 12, Tang teaches scanning said incoming network data using lexical token scanning of data stream (see abstract, statements in a program are lexically scanned and parsed into a parse tree).

4. Claims 3 and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riddle in view of Tang, further in view of Moreno, U.S. Patent No. 5,951,674.

As to claims 3 and 18, Riddle and Tang teach a method for classifying received network data comprising scanning incoming data using lexical token scanning wherein said network data is treated as a stream of input bytes, said network data being organized into data packets, said scanning resulting in the identification of a data packet belonging to one of a plurality of classes (see the rejection of claim 1).

Riddle and Tang do not teach the limitation "scanning includes identifying a skip operation and in response thereto skipping over one or more subsequent input bytes". However Moreno teaches identifying a skip operation and in response thereto skipping over one or more subsequent input bytes (see claims 7 and 8).

It would have been obvious for one of the ordinary skill in the art at the time of the invention to modify Riddle in view of identifying a skip operation and in response thereto skipping over one or more subsequent input bytes as in Moreno. One would be

motivated to modify Riddle in view of identifying a skip operation and in response thereto skipping over one or more subsequent input bytes because doing so would allow the processor to detect an error in the stream of incoming data and skip to the next data stream by detecting address of the beginning of the next incoming data packet.

As to claim 19, Moreno teaches said number is specified by the value of a current input byte (see col. 13).

As to claim 20, Moreno teaches said number is specified in a register (see col. 13).

As to claim 21, Moreno teaches detecting an operator indicating a value to be saved in a register (see col. 13).

As to claim 22, Moreno teaches detecting an operator indicating a logical operation to be performed on the contents of said register (see col. 13).

5. Claims 5-7 and 9 are rejected under 35 U.S.C 103(a) as being unpatentable over Riddle in view of Tang in further view of Del Monte, U.S. Patent No. 5,704,060.

As to claim 5, Riddle and Tang teach a method for classifying received network data comprising scanning incoming data using lexical token scanning wherein said network data is treated as a stream of input bytes, said network data being organized into data packets, said scanning resulting in the identification of a data packet belonging to one of a plurality of classes (see the rejection of claim 1).

Riddle and Tang do not teach the limitation "providing a DFA and recognizing data packets using said DFA including transitioning from one state to another".

However, Del Monte teaches providing a deterministic finite automaton (DFA) (see col. 14 lines 21-31).

It would have been obvious for one of the ordinary skill in the art at the time of the invention to modify Riddle in view of including a DFA as in Del Monte including a representation of said lexical tokens as in Tang. One would be motivated to include a DFA including recognizing the lexical tokens using the DFA in Riddle because doing so would allow the DFA to determine the classification of the data packet and map an ordered sequence of input events into a corresponding sequence according to the control section of the data where the next state is uniquely determined by a single input event.

As to claim 6, Riddle teaches data packets are variable length data packets (see claim 1).

As to claim 7, Del Monte teaches said DFA is defined by a set of regular expressions (see col. 14 lines 21-31).

As to claim 9, Riddle teaches said states include one or more associated computer instructions wherein said computer instructions are executed in connection with transitioning to a state (see fig. 3 and its corresponding illustration).

6. Claims 8,16 and 17 are rejected under 35 U.S.C 103(a) as being unpatentable over Riddle in view of Tang in further view of Del Monte in view of Eager et al., U.S. Patent No. 5,960,200 (referred to hereafter as Eager).

As to claims 8 and 16, Riddle, Tang, and Del Monte teach a method for classifying received network data comprising scanning incoming data using lexical

token scanning wherein said network data is treated as a stream of input bytes, said network data being organized into data packets, said scanning resulting in the identification of a data packet belonging to one of a plurality of classes providing a DFA (see the rejection of claim 5).

The combined teachings of Riddle, Tang, and Del Monte do not teach the limitation "producing a NFA and converting said NFA to produce said DFA)". However Eager teaches producing a NFA and converting said NFA to produce said DFA (see col. 15 lines 51-67).

It would have been obvious for one of the ordinary skill in the art at the time of the invention to modify Riddle in view of producing a NFA and converting NFA to produce FDA because doing so would provide faster processing since processing of DFA takes less time than processing NFA.

As to claim 17, Del Monte teaches reducing said DFA to a compressed form (see col. 3 lines 56-67).

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Riddle in view of Tang, in view of Del Monte further in view of Moreno.

Riddle and Tang teach a method for classifying received network data comprising scanning incoming data using lexical token scanning wherein said network data is treated as a stream of input bytes, said network data being organized into data packets, said scanning resulting in the identification of a data packet belonging to one of a plurality of classes (see the rejection of claim 1).

Riddle and Tang do not teach the limitation "some of said states further include a skip instruction". However Moreno teaches a skip instruction (see claims 7 and 8).

It would have been obvious for one of the ordinary skill in the art at the time of the invention to modify Riddle in view of identifying a skip operation and in response thereto skipping over one or more subsequent input bytes as in Moreno. One would be motivated to modify Riddle in view of identifying a skip operation and in response thereto skipping over one or more subsequent input bytes because doing so would allow the processor to detect an error in the stream of incoming data and skip to the next data stream by detecting address of the beginning of the next incoming data packet.

8. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riddle in view of Del Monte

As to claim 13, Riddle teaches a method for classifying data packets comprising the steps of providing one or more regular expressions, each having an associated class identifier, receiving plural data packets, each having a length not necessarily equal to one another, and for each data packet, determining a matching one of said regular expressions that matches said data packet, wherein said each data packet is classified according to the class identifier associated with said matching regular expression (see the rejection of claim 11).

Riddle doesn't teach the method of claim 1 wherein the method further including providing a deterministic finite automaton (DFA) representing said grammar graph.

However, Del Monte teaches providing a deterministic finite automaton (DFA) representing grammar graph (see col. 14lines 21-31).

It would have been obvious for one of the ordinary skill in the art at the time of the invention to modify Riddle in view of including a DFA representing said grammar graph as in Del Monte. One would be motivated to include a DFA in Riddle because doing so would allow the network to map an ordered sequence of input events into a corresponding sequence according to the control section of the data where the next state is uniquely determined by a single input event.

As to claim 14, Del Monte teaches DFA is in compressed form (see col. 2 lines 48-56).

As to claim 15, Del Monte teaches compiling said regular expressions to produce said DFA (see col. 2 lines 48-56).

9. Claims 30 and 37-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riddle in view of Tang in view of Del Monte, further in view of Boucher.

As to claim 30, Boucher teaches compiling second classification, configuring a programmable hardware packet classifier to classify said received packets, applying said data stream to said hardware packet classifier wherein data packets are classified according to said second classification rules (see claim 7, if the classification properties doesn't exist, a new classification class is created wherein the next incoming data packet is classified according to the already existing class and the new classes that has been created).

As to claim 37, Riddle, Tang and Del Monte do not teach the limitation "base memory, next state memory and base memory configured to contain address locations of said next state memory". However Boucher teaches method of protocol processing including a base memory, next state memory and base memory configured to contain address locations of said next state memory (see fig. 15A-C).

It would have been obvious for one of the ordinary skill in the art at the time of the invention to modify the combined teachings of Riddle in view of using a base memory, next state memory and base memory configured to contain address locations of said next state memory as in Boucher. One would be motivated to include a base memory in Riddle because doing so would allow DFA to determine the classification of the data packet and map an ordered sequence of input events into a corresponding sequence according to the control section of the data where the next state is uniquely determined by a single input event where the corresponding sequence is determined by the next state memory and the single input is determined by the base memory.

As to claim 38, Boucher teaches memories are random access memories (see fig. 15A).

As to claim 39, Boucher teaches said memories are read-only memories (see fig. 13 and its corresponding illustration).

As to claim 40, Riddle teaches a network data configured to provide a data packet comprising a stream of data (see claim 1 and fig. 1) and a memory system configured with data representing a class index corresponding to each of said

terminating states and configured to output a class index in response to production of said reached terminating state (see claim 7).

Riddle doesn't teach the limitation "a first system of memory configured with data representing DFA and configured to lexically scan said data stream".

However Tang Del Monte teaches a system of memory configured with data representing a DFA (see col. 14lines 21-31) and Tang teaches a system of logic circuits configured to lexically scan a data stream (see abstract, statements in a program are lexically scanned).

It would have been obvious for one of the ordinary skill in the art at the time of the invention to modify Riddle in view of decompression logic configured to scan data with DFA as in Del Monte and lexically scan data as in Tang. One would be motivated modify Riddle by using a memory configured with data representing DFA and lexically scan of data because doing so would allow the network to map an ordered sequence of input events into a corresponding sequence by scanning the lexical tokens according to the control section of the data where the next state is uniquely determined by a single input event.

As to claim 41, Riddle teaches a third memory configured to contain current state information for plural input channels (see claim 1 and fig. 1).

10. Claims 23-29, 31-36 and 42-54 do not add any new limitations above claims 1-22 and claims 37-41 and therefore are rejected for similar reasons.

11. Applicant's arguments filed have been fully considered but they are not persuasive.

In the remarks, the applicant argues in substance that; A) Riddle does not teach the limitation "determining a matching one of said regular expressions that matches said data packet"; B) Riddle does not suggest the use of lexical tokens for packet classification; C) Tang does not suggest applying lexical scanning to network data; D) Riddle does not teach "identifying an arithmetic operation and performing said arithmetic operation"; E) Riddle cannot apply skip function in data network packets F) Moreno does not suggest modifying Riddle to incorporate a register G) Del Monte teaches the use of DFA in parsing documents which makes it improper to combine Del Monte's teachings to Riddle.

In response to A) Riddle classifies data packets according to a set of rules that define the grammar for the classification of data (see col. 13 lines 57-col. 14 lines 9) for example Riddle checks the protocol type and the port number of the incoming data packets and accordingly classifies the data packets (see col. 14 lines 50-col. 15 lines 20) and therefore the protocol type and the port number are considered to be the regular expressions.

In response to B) Riddle parses the data packets and produces tokens such as the protocol type and the port number and classify data packets according to these attributes (see col. 14 lines 50-col. 15 lines 20).

In response to C) In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so

found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the IP packet is parsed to identify attributes such as protocol type and the port number and classify data packets according to these attributes (see col. 14 lines 50-col. 15 lines 20).

In response to D) Riddle teaches keeping a record of number of hits and the number of times a port has been used in an interval of time (see col. 14 lines 15-30 and col. 15 lines 30-45). There is no limit on the kind of arithmetic operation and therefore Riddle arithmetic operation meets the scope of the claimed "identifying an arithmetic operation and performing said arithmetic operation".

In response to E) Riddle uses C language to classify data packets (see col. 5 lines 60-67) where one of the ordinary skill in the art would know how to implement skip and branch functions using C language.

In response to F) In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In response to G) Riddle uses the parsed data such as port number and protocol type to classify but does not uses DFA to organize the parsed data. However Del Monte teaches the use of DFA to organize parsed data (see col. 14 lines 21-31) and therefore it would have been proper to use incorporate DFA in Riddle.

12. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hussein A El-chanti whose telephone number is (703)305-4652. The examiner can normally be reached on Mon-Fri 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (703)308-7562. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hussein Elchanti

March 19, 2004

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